



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,321	07/28/2003	David Delaney	SKEL-007	6585

24353 7590 06/30/2006

BOZICEVIC, FIELD & FRANCIS LLP
1900 UNIVERSITY AVENUE
SUITE 200
EAST PALO ALTO, CA 94303

EXAMINER

JONES, DAMERON LEVEST

ART UNIT PAPER NUMBER

1618

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/629,321	Applicant(s) DELANEY ET AL.	
	Examiner D. L. Jones	Art Unit 1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
 4a) Of the above claim(s) 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 and 25-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

ACKNOWLEDGMENTS

1. The Examiner acknowledges receipt of the amendment filed 4/6/06 wherein claims 1, 10, 25, and 26 are amended.

Note: Claims 1-29 are pending.

RESPONSE TO APPLICANT'S AMENDMENT/ARGUMENTS

2. The Applicant's arguments and/or amendment filed 4/6/06 to the rejection of claim made by the Examiner under 35 USC 102, 103, 112, and/or double patenting have been fully considered and deemed persuasive for the reasons set forth below.

Double Patenting Rejection

The double patenting rejection over 10/851,766 is WITHDRAWN for reasons of record in Applicant's response filed 4/6/06.

112 Rejections

The 112 rejections are WITHDRAWN for reasons of record in Applicant's response filed 4/6/06.

102 Rejection

The 102 rejection is MOOT in view of the new grounds of rejection below.

103 Rejection

The 103 rejection is MOOT in view of the new grounds of rejections below

WITHDRAWN CLAIMS

3. Claim 24 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention/species.

NEW GROUNDS OF REJECTION

103 Rejection

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-23 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wenz (WO 2004/050131) in view of Constantz et al (US Patent No. 6,334,891) and Constantz et al (US Patent No. 6,719,993).

Wenz discloses a cement preparation that comprises a powdery component including calcium phosphate and an aqueous liquid component. A radio opaque material is added to at least one of the powder and liquid components, and the components may be combined into a pasty substance (see entire document, especially, abstract; page 6, paragraph [0018]). One aspect of Wenz discloses that the cement preparation comprising a calcium phosphate powder is mixed with a radioopaque and water or an aqueous compound and the mixture is allowed to harden (page 2, paragraph [0008]). The cement preparation comprises a mixture of salts. The contrast (radioopaque) agent may be a barium salt, tantalum, zirconium, or tungsten (pages 2-3, bridging paragraph). Additives may be incorporated into the calcium phosphate composition and aqueous liquid component to result in a material having a paste-like (pasty) consistency possessing good flowability characteristics (page 3, lines, 19-22).

Art Unit: 1618

In order to provide a cement preparation with enhanced radiopacity, improved flowing characteristics, and improved mechanical properties (particularly improved strength upon hardening), the cement preparation preferably comprises a powdery component including calcium, magnesium, and orthophosphate. An additive which enhances x-ray contrast is preferably combined in the powdery compound and is advantageous in that the hardening characteristics and/or the mechanical properties is/are essentially not deteriorated (page 4, paragraph [0014]; page 5, paragraph [0016]; page 8, paragraph [0024]). The admixture of barium salts into the calcium phosphate mixture result in better cohesion while ensuring at the same time appropriate hardening characteristics. In addition, the mechanical properties, especially the strength of the hardened cement is enhanced by barium salt. Possible barium salts include barium iodide (Note: According to the Merck Index, page 1001, barium iodide is freely soluble in water). Depending on the purpose and the intended use of the composition, the additive for enhancing radiopacity may be capable of being stably incorporated into the reaction product of the cement preparation. Alternatively, the additive for enhancing radiopacity is capable of being loosely incorporated but eliminated from, or leaked out of the hardened cement product after being applied to the desired target, in order to improve biocompatibility and to minimize tissue irritation at the target site. In Example 1 (page 10), a cement composition is disclosed wherein components comprising tricalcium phosphate, $\text{Mg}_3(\text{PO}_4)_2$, MgHPO_4 , SrCO_3 , and BaSO_4 are thoroughly mixed with $(\text{NH}_4)_2\text{HPO}_4$ to generate a pasty mass which subsequently hardens. In Example 2 (page 10), all of the components of Example 1 with the exception of BaSO_4 were thoroughly mixed and

Art Unit: 1618

allowed to harden. The compressive strength of the components was found to be 24.11 MPa. Wenz fails to disclose a kit and packaged cement having a tubular element containing the components, a setting fluid comprising silicate, and a removable clip barrier. In addition, Wenz does not specifically disclose that barium chloride is used or that the flowing composition sets in about 5 to 10 minutes. Furthermore, while Wenz discloses that the compressive strength of the components of Example 2 is 24.11 MPa (this is for a cement component containing an insoluble contrast agent, BaSO₄), the reference fails to disclose that the compressive strength of components comprising a water soluble contrast agent is between 25 and 100 MPa.

Constantz et al (US Patent No. 6,334,891) disclose paste compositions that can be administered by syringe to set in situ to serve as a support structure, filler, or prosthesis (see entire document, especially, abstract). The reactants may comprise phosphate and calcium containing products and a liquid (columns 4-5, bridging paragraph). Implantation of the composition may be by syringe or catheter. The composition components once mixed are allowed to anneal while remaining quiescent, followed by an extended period of time during which the mixture hardens. During the hardening stage, crystal growth occurs and the product becomes an integral mass. Hardening will take at least about 5 minutes, usually, at least about 15 minutes, and not more than about 20 minutes (column 6, lines 19-33). In addition, the components of the composition may be packaged in kit form (column 11, claim 11).

Constantz et al (US Patent No. 6,719,993) disclose calcium phosphate cements that are prepared from silicate solutions. In addition, Constantz et al disclose that the

Art Unit: 1618

compositions may be placed in kit for use in a variety of applications (see entire document, especially, abstract). The methods of generating the cements of Constantz et al produce flowable compositions (i.e., injectable pastes) that set into calcium phosphate products. The dry reactants include a calcium and phosphate source combined with a solution of a soluble silicate (columns 1-2, bridging paragraph; column 3, lines 28-48). The silicate compound may be any compound that is physiologically compatible and it (silicate compound) is soluble in water (columns 2-3, bridging paragraph). Since the silicate solution enhances the speed and mixability of the components, a simple cylindrical tube may be used both as a storage and packaging device and a mixing and delivery device. The plastic tube is separated into at least two compartments or portions. One section/portion contains the silicate solution and another contains the powder component. The two compartments are separated from each other by an easily removable barrier which may be readily removed during preparation of the packaged cement. Any convenient removable barrier may be present in the device. When one is ready to mix the composition, the clip or other barrier means between the areas (liquid and powder) is removed (e.g., unclipped) and the contents are kneaded together by hand (columns 4-5, bridging paragraph). The compressive strength of the product into which the flowable composition sets may vary significantly depending on the particular components employed to produce it (column 6, lines 26-28). Kits comprising the cements wherein the dry and liquid components may be present separate containers in the kits or some of the components may be combined into one container, such as a kit wherein the dry components are present in a first container and

Art Unit: 1618

the liquid components are present in a second container are possible. The kits may also include a device for aspirating a desired target area. In addition, the kits typically will contain instructions for using the components of the kit (column 10, lines 13-53). Furthermore, Constantz et al disclose (see columns 12-13, claims 1-14) that (a) their composition has a ratio of 0.2:1 to 0.7: (b) their method results in a paste; (c) the compressive strength of their product ranges from 25 to 100 MPa; and (d) the flowable composition sets into the calcium phosphate containing product in a period of time ranging from about 5 to 10 minutes.

A skilled practitioner in the art would recognize that both Applicant and Wenz disclose a method of producing a flowable composition and a method of producing a paste composition wherein the composition comprises calcium and phosphate source, a setting fluid, and a contrast agent. In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Wenz using the teachings of Constantz et al (US Patent No. 6,334,891) and generate both a kit and packaged cement product because Constantz et al disclose that it is known in the art to place the components of a paste comprising a calcium source, phosphate source, and other necessary components into a kit (see claim 11, for example, in Constantz et al, US Patent No. 6,334,891). In regards to the packaging of the of the cement and the use of a tubular element, Constantz et al not only disclose that the cement components may be placed in a kit, but also address how implantation of the composition occurs. Implantation may be by syringe or catheter wherein the composition may be used as a paste that is passed through a needle. Hence, the use

Art Unit: 1618

of a tubular element is within the scope of Constantz et al. Furthermore, since both Wenz and Constantz et al disclose compositions comprising a calcium and a phosphate source, and a setting fluid, a skilled practitioner in the art would recognize that the references are within the same field of endeavor. Thus, the teachings of the references are combinable.

It would have been obvious to one of ordinary skill in the art at the time the invention was made that barium chloride is encompassed within the scope of the phrase 'barium salt' as set forth by Wenz. In addition, the skilled practitioner in the art would recognize that that the composition begins to set within 10 minutes because Wenz discloses that once the components are added and mixed thoroughly, the mixture subsequently hardens indicating that once all ingredients are present and mixed hardening begins instantly (see for example, Example 1, page 10). Furthermore, as indicated in Constantz et al (US Patent No. 6,334,891), hardening ranges from about 5 minutes to about 20 minutes which overlaps the range set forth by Applicant.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Wenz using the teachings of Constantz et al (US Patent No. 6,719,993) because both Wenz and Constantz et al disclose calcium phosphate cement compositions. Specifically, the disclosure of Constantz et al differs from that of Wenz in that it does not disclose a contrast agent in combination with the calcium phosphate composition. However, Constantz et al does disclose a silicate solution as the setting fluid; a calcium phosphate composition having a compressive strength ranging from about 25 to 100 MPA; a tubular element having a removable clip

Art Unit: 1618

barrier; a ratio of 0.2:1 to 0.7:1 of the dry reactants to setting fluid; and kits comprising the calcium phosphate composition. In regards to the compressive strength disclosed in Wenz for a non-soluble contrast agent, it should be noted that the mixture of Constantz et al, which lacks a contrast agent, discloses that the compressive strength of its mixture ranges from 25 to 100 MPa; hence, a skilled practitioner in the art would recognize that the incorporation of a contrast agent into the mixture does not drastically alter the overall cement product even though it may alter the compressive strength of the composition. As a result, one would expect the compressive strength of Constantz et al to be the same/similar for those wherein a contrast agent has been incorporated. Furthermore, Constantz et al specifically discloses that the flowable composition sets into the calcium phosphate containing product in a period of time ranging from about 5 to 10 minutes (see column 12, claim 5). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a contrast agent since Wenz discloses a calcium phosphate composition having the same characteristics as that of Constantz et al, but with a radioopaque material (contrast agent) present. Thus, since both Wenz and Constantz et al disclose compositions comprising a calcium and a phosphate source, and a setting fluid, a skilled practitioner in the art would recognize that the references are within the same field of endeavor. Thus, the teachings of the references are combinable.

It should be noted that while on page 8, paragraph [0025], Wenz discloses that the additive for enhancing radiopacity is capable of being loosely incorporated but eliminated from, or leaked out of the hardened cement product after being applied to the


Art Unit: 1618

target area, it is noted that the recitation 'capable of' is not a positive limitation, but only discloses that the mixture has the ability to perform a desired function. Furthermore, Wenz disclose that discloses why the additive is loosely incorporated, but eliminated out of the hardened cement product, it is in order to improve biocompatibility and to minimize tissue irritation at the target site.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to D. L. Jones whose telephone number is (571) 272-0617. The examiner can normally be reached on Mon.-Fri., 6:45 a.m. - 3:15 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Hartley can be reached on (571) 272-0616. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



D. L. Jones
Primary Examiner
Art Unit 1618

June 22, 2006